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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • OCTOBER 10, 1942

TECHNOLOGY/DE



Rubber Cultivation

See Page 230

A SCIENCE SERVICE PUBLICATION

## Do You Know?

Glass plaques are replacing war metals for memorials and commemorative tablets.

Protein supplement food grown for animals will approximate 7,500,000 tons or 111 pounds per animal, in 1942-43.

Jojoba, new vegetable oil, has remarkable stability under heat, freedom from color and odor, and a limpid character.

Over 5,000,000 tons per month is the present estimate of finished steel products rolling off production lines in America.

A species of *digitalis* which grows wild in Chile is believed to compare favorably with that formerly imported from European sources.

To step up egg production, poultry scientists recommend that farmers select breeding hens for persistency, the ability to lay late into the fall.

Huge felt patterns, used in paper mills, are being salvaged from discard piles by the Red Cross and converted into warm wool blankets.

War-time percolators are being made with glass "bushings" to replace hard rubber parts, and with plastic replacing aluminum for baskets and pumps.

Ball cartridges, armor piercing bullets, and tracer bullets, the three general types of small arms ammunition, each have an outer jacket of brass and a filling which is partly lead.

## Question Box

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Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

Of electricity consumed in 1941, 76% went to industry, 15% to homes, and 9% to service uses.

Experimenters are testing the medicinal value of a Mexican corn fungus, *huilacoe*, as a substitute for ergot.

War requirements for military cloth have created a textile industry need for dogwood timber, to make shuttle blocks.

Engineering classes at 2 o'clock in the morning are a recent addition to the program of one university, for the benefit of night-shift workers.

A photo-reflectometer, devised to maintain a constant "brown" for brown sugar, will, according to its inventors, measure the exact amount of color in cloth, paper, paint, or any other opaque substance.

## SCIENCE NEWS LETTER

Vol. 42 OCTOBER 10, 1942 No. 15

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington, D. C. North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Scienserve, Washington.  
New York office: 310 Fifth Avenue, CHickering 4-4665.

Entered as second class matter at the post-

office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark. U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The Science Observer, established by the American Institute of the City of New York, is now included in the SCIENCE NEWS LETTER.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STate 4439.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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## MEDICINE

# Safer Use of Sulfas

**Wider benefits from drugs may result from research. Toxic symptoms prevented in rats. Experiments hint of discovery of new B vitamins.**

► GREATER, because safer, usefulness for the sulfa drugs and the discovery of several new B vitamins may result from research by Dr. S. S. Spicer, Dr. Floyd S. Daft, Dr. L. L. Ashburn and Dr. W. H. Sebrell, of the National Institute of Health, U. S. Public Health Service. Results of their research so far are reported in *Science* (Oct. 2) with more details scheduled for early publication in *Public Health Reports*.

The remarkable achievements of the sulfa drugs in fighting germ infections, from pneumonia to infections in wounds, have been somewhat offset by the development in occasional patients of what doctors call "toxic reactions" to the drugs. Among these reactions, which both deny the patient the benefit of the drug and give him another ailment to fight, is agranulocytosis. In this condition the granulocytes, white blood cells that fight germ diseases, are greatly reduced in numbers. About three out of every 100 patients given sulfa drugs develop either agranulocytosis or anemia. Thirty or forty have already died of agranulocytosis following sulfa drug treatment.

This condition may result because the sulfa drugs interfere with the production or action of some as yet unknown vitamin, it appears from the experiments by the Public Health Service scientists. If that proves to be the case, suitable doses of the vitamin may make possible the safer use of the sulfa drugs in many more patients.

Rats have so far been the patients in these latest discoveries, so the scientists are cautious about promising too much benefit for humans. Rats on a purified diet supplemented by all known B vitamins needed to keep rats healthy develop agranulocytosis from sulfaguanidine and sulfasuxadine, two of the newest sulfa drugs. They also develop hardening and calcification of the blood vessels; necrosis and calcification of voluntary muscles; and a skin disease. The latter can be successfully treated or prevented with biotin.

The other symptoms can be overcome by doses of materials extracted from liver and yeast. These materials are not any of the known B vitamins and

the doses effective in overcoming toxic effects of sulfa drugs are so small the scientists feel sure the materials must be vitamins.

The search for possible new vitamins started this work which may lead to greater benefits from sulfa drugs. A number of scientists had found that sulfaguanidine retarded the growth of young rats fed a purified diet. Rats manufacture some growth vitamins in their intestinal tracts, so it was thought the sulfa drug effect on rat growth might be due to interference with this vitamin manufacture.

Investigation of this problem led to the realization that probably several new vitamins existed which could be discovered with the aid of the sulfa drugs. But the possibility of increasing the effectiveness of sulfa drug treatment is so important at the present time that the work is now being pushed along those lines.

*Science News Letter, October 10, 1942*

## ENGINEERING

## New RCA Laboratories Dedicated at Princeton

► "ELECTRON HOUSE," new home of RCA Laboratories, was dedicated in Princeton, where a year ago there was

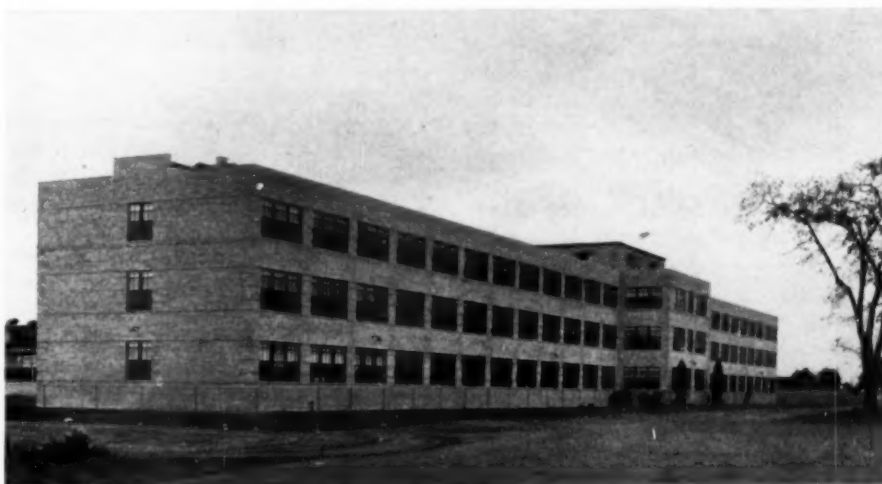
only quiet, green New Jersey farmland.

It is a 488-foot long, three-story structure with 150 laboratory bays in which almost every kind of research related to radio and electronics can be undertaken. Considered "one of America's great arsenals of science," many of the projects are now military and secret. From these new laboratories are sure to come new developments not only important in war but useful in the peace that is to follow.

Laboratories in the new building are devoted to television, optics, chemistry, acoustics, electron tube making, radio facsimile, cathode ray, transmitter tubes, etc. A high frequency laboratory is on the roof. In a corner of the 260-acre area is a field laboratory. In an extensive model shop all sorts of experimental instruments are made as they are needed.

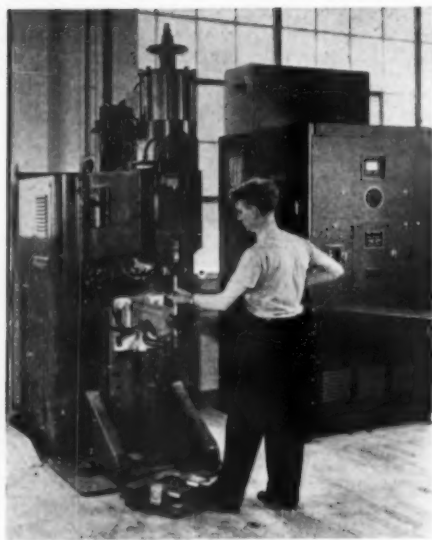
For research with fluorescent or "glow" materials, the chemical laboratory has several dust-proof rooms. The rooms of the optics laboratory can be opened up so as to get several hundred feet of space in which to test long beams of light. A free sound room, three stories high, is so heavily padded and acoustically "dead" that one of the scientists explained that spoken words sound "as if you are going under ether." This room does for sound what a darkroom does for light.

Supply shafts of unique design run from basement to roof in 104 locations to carry all sorts of electricity, gas, water, compressed air and gases, etc. to 420 work benches. There are little workshops in the corridors on each floor where a researcher can go to make with his own hands a part that he needs immediately.



**NEW LABORATORIES**—This is the new building of RCA Laboratories, facing the afternoon sunshine.





**BIG**—This resistance welder at RCA Laboratories is one of the largest in the country. It will weld aluminum and has an electronic power supply, which in appearance resembles a radio transmitter.

The dedication ceremonies were held on Sunday (Sept. 27) in order not to interrupt the daily work of both visitors and the laboratories.

*Science News Letter, October 10, 1942*

#### PHYSICS

### Bump Gives Automobile Seven Kinds of Motion

➤ AN AUTOMOBILE traveling over a bumpy road is subject to seven different kinds of motion in addition to the smooth straightforward one we would all prefer. These are the bounce, pitch and roll, and four kinds of vibration from the wheels. Each has a different frequency. All seven are excited by the passage of one wheel over one bump. Multiply the number of bumps by the number of wheels and you may want to stay at home.

All this was found out by Pierre Ernest Mercier of Electro-Mechanical Research, Inc., of Houston, Texas, after an extensive study of the subject which he reported in the *Journal of Applied Physics*. As a result he finds that independent springing of each wheel is better than springing only the axles. But he has also devised and tested a number of "suspensions" which are superior to any now in use. Perhaps, after the war, our automobiles will roll more smoothly than ever.

*Science News Letter, October 10, 1942*

#### ASTRONOMY

## Comet Is Not New One

"Discovery" announced by Finnish astronomer turns out to be the famous Schwassmann-Wachmann Comet No. 1, constantly observed for last 15 years.

➤ A NEW comet announced by L. Oterma at the Observatory of the University of Turku, Finland, reported to Harvard Observatory through Lundmark, Sweden, is declared by Harvard astronomers to be none other than the famous Schwassmann-Wachmann Comet No. 1 which has been under constant observation by American astronomers for the past 15 years.

This is not the first time that this comet has been mistaken for a new one. On August 29, 1941, Dr. G. Neujmin of the Simeis Observatory in the Crimea observed it and announced a new comet. But only a few weeks before Prof. G. Van Biesbroeck had observed it at the Yerkes Observatory. This time again it was observed only shortly before being mistaken for new, namely, on Sept. 6 at the McDonald Observatory. Dr. Van Biesbroeck has recently calculated its positions for the last four months of this year.

This comet is one of the most remark-

able known. Its orbit is nearly circular, lying wholly between the orbits of Jupiter and Saturn about 500,000,000 miles from the sun—five times the distance of the earth from the sun. From time to time, the comet, for some unknown reason, increases in brightness, although never becoming visible to the unaided eye. It was during one of these flare-ups that it was discovered in 1927 by the two German astronomers whose name it bears. And it was at a flare-up on each occasion that it was mistaken for new.

Because of its nearly circular orbit, the comet is seldom beyond reach of our powerful telescopes and our photographic plates. It descends at times to the 18th magnitude, at other times brightens, as at present, to the 12th magnitude, 250 times as bright. It shows at present a sharp nucleus surrounded by a nebulous envelope. At other times it appears like a faint star.

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#### ASTRONOMY

## Only Skin Deep

Bursting forth of a new star is not a deep-seated cataclysm, but a surface explosion. Afterwards the star returns to its retiring normal life.

➤ A TEMPORARY star or nova which suddenly flares up in the heavens without warning and then gradually fades, is not quite the cataclysmal event that some theoretical physicists have supposed. This view was expressed by Dr. Dean B. McLaughlin, professor of astronomy at the University of Michigan and secretary of the American Astronomical Society, speaking before the Rittenhouse Astronomical Society at the Franklin Institute.

The outburst is a surface explosion, Dr. McLaughlin believes, of tremendous proportions to be sure, involving as it does the entire surface, but not necessarily fatal. After "blowing off steam," the star returns to approximately its former state. Its temporary excursion into notoriety produces little change in its nor-

mally humdrum life in the heavens.

Dr. McLaughlin's view is based on a personal examination of all spectra of "novae," or new stars gathered at the University of Michigan Observatory and at the other leading observatories of the United States. It is a good idea, he said, for "one set of eyes, with one set of prejudices" to examine all the observational material.

New stars at maximum light, he explained, are about 50,000 times as bright as the sun, though they are so far distant that they appear like ordinary stars. Before outburst they are about the same real brightness as the sun but are smaller, denser and hotter—a type known as sub-dwarfs.

Increase of light from minimum to maximum takes only a few days, but

the decline takes several years. The flare-up must be due to an explosion whose cause is not known. The surface layers expand as a cloud of gas around the star at a speed of hundreds of miles per second. After some months the expelled clouds of gas become visible as a faint nebula around the star.

At the end of the decline the star

is apparently not changed from its previous condition, and it must be concluded that all the disturbance is superficial.

Altogether about 90 novae have been recorded in our milky way system, and over 100 have been found in the neighboring spiral nebula Andromeda.

*Science News Letter, October 10, 1942*

#### PHARMACY

## Atabrine Production Big

**Synthetic anti-malarial now produced at rate of half billion tablets per year. Called satisfactory substitute for war-scarce quinine.**

► ATABRINE, substitute for war-scarce quinine, is now being produced at the rate of about a half billion tablets per year. Actual production totals may fall somewhat short of this estimate, according to authorities. Still there will be plenty of anti-malarial units to treat millions of cases of the deadly, disabling fever.

High speed laboratory machines are spewing tablets of the bright yellow crystals at an ever increasing rate—making bullets to attack malaria to which the armed forces are exposed.

With our men fighting the world round in malaria infested tropics, anti-malarial supplies are of vital importance. The periodic fever is not only a serious disease but could dangerously affect combat strength.

"We have four enemies," one military medical authority declares, "Japan, Germany, Italy—and malaria. There is only one that can lick us. That's malaria. We've got to get results."

Many Army doctors still prefer natural quinine, extracted from cinchona bark, to atabrine synthesized in the laboratory. But our dwindling stockpile of quinine was obtained mainly from Jap held territory in the Far East. Atabrine relieves the shortage.

It should do the job just as effectively as quinine, it is reported by most investigators. There are fewer relapses of cases treated with atabrine, in fact, than when treated with quinine.

Atabrine also compares favorably with quinine in suppression of the disease, clinical reports show. Malarial parasites which hitch-hike from one soldier to another via the mosquito, are eliminated from the blood picture in about a week under either method of treatment.

Only about a fifth as much atabrine as quinine is required for an effective dose. This amounts to about a seventy-second of an ounce of atabrine per day.

More undesirable side reactions are caused by atabrine than with quinine, some physicians believe, but this is probably not frequent or severe enough to be an important factor. Continued administration sometimes also causes a yellow coloration of the skin which disappears after a couple of weeks.

Known chemically as quinacrine hydrochloride, atabrine has been admitted to the new edition of the U. S. Pharmacopoeia, the official book of drugs which will be adopted in November.

Supplies of chemicals to make the medicine are reported as adequate for our needs. And as production goes up, cost goes down. At the present price, it costs the government about as much for atabrine to treat a case of malaria as it does to send an airmail letter, the manufacturer reports.

Quinine treatment costs several times as much.

Atabrine was tested during field maneuvers last fall. Results were called very good by Army doctors.

Although gigantic production estimates are unofficially confirmed in reliable quarters, the fact remains that only two companies are in production. Manufacture in this country is based on control of formerly German-owned patents now in the hands of the Alien Property Custodian.

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When plans for a power dam are drawn up, detailed descriptions of the geology of the proposed site, with data on the character and structure of the rock formations, must be tabulated.

#### MEDICINE

## Hormones Are Concerned With Origin of Cancer

► SOMETIMES A WOMAN is afraid she has cancer because she has noticed some change in her breast or has had more or less bleeding than usual each month. These signs might mean cancer, and the wise woman will consult her physician about them at once. The physician may find, however, that the changes are due to change in hormone production.

Hormone disorders are particularly likely to occur in the forties, shortly before the change of life, at an age when tumors are also becoming more common. Hormones also may play a part in causing cancer to develop. To help women understand better the relation between hormones and cancer, Dr. Howard C. Taylor, Jr., of Memorial Hospital, New York, lectured on the subject at the officers training school of the Women's Field Army of the American Society for the Control of Cancer.

"The reproductive organs of women," he explained, "are to a large extent controlled by a special group of chemical substances called hormones. These substances are produced in several of the endocrine glands of the body, those having the most importance being the anterior pituitary gland and the ovary.

"The influence of the hormones is twofold. First of all they lead to the growth and development of the reproductive organs at the time of their adolescence and maintain them in an active state during the years of reproductive life. The hormones are, however, also responsible for the proper functioning of the uterus, the ovaries and the breasts, for the regular recurrence of menstruation and for much that is essential to the normal development of pregnancy.

"The evidence that the hormones are concerned with the origin of tumor growth is quite convincing. In many laboratories it has been possible by the injection of hormones, particularly those of the type formed in the ovary, to produce a great variety of tumors. In guinea pigs fibrous nodules develop in the uterus which are quite similar to the fibroids appearing so commonly in women at about the fortieth year. In mice the ovarian hormones certainly increase the tendency to cancer of the mammary glands.

"For the human being the evidence is not so good, but it has long been known that certain non-malignant

tumors of the uterus grow only during the years of active ovarian function and

begin to shrink after the change of life or if the ovaries are surgically removed."

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#### PSYCHOLOGY

## "Door-Key Children"

Youngsters who used to stay only a short while on the playground now arrive in the early morning with the front door key and money for the evening meal.

► "DOOR-KEY" CHILDREN of war workers are a new problem in many communities. Supplying these offspring of the war and their parents with proper recreation was the main problem of the War Recreation Congress meeting in Cincinnati.

Children whose parents are at work or war, often come to the playgrounds in the morning bringing the front door key with them. Children who used to stay only a short while now remain all day until mother returns from work.

On a Baltimore playground the youngsters deposit their keys on a key-board when they enter, Ruth Garber Ehlers, Baltimore supervisor of social recreation, reported. Many of them check marketing money with the leader. When it is time to go home, the leader returns keys and the grocery money for the evening meal.

Special central playgrounds have been established in defense areas so that the children can be cared for.

"Stowaways" have even been found here. Tots in baby carriages, too young to be accepted at the playgrounds, are left there when the leader isn't looking. The mothers go to work.

To care for these "defense work orphans," day nurseries have been opened in Paterson, N. J. Admission is 25 cents per day "American plan," according to William Brutner, acting superintendent of recreation there.

Canada has found this problem serious enough to set up a government sponsored plan, Jean Hall, Women's Division of Canadian National Selective Service, told the Congress. The new program to care for children of war workers will go into effect within the next few weeks. Thousands of married women with children, answered the first call for workers without making proper provision for their offspring.

The Canadian plan, perhaps a foretaste of things to come in this country, provides nursery care for small children. Lunches will be served to school child-

ren and they will be cared for after school hours until their mothers return from factories. There is also provision in the government plan for "foster homes" for those who prefer that type of care.

Despite separation of families by war work, after-hours recreation is helping to bring adults and children closer together in their relationships, said Russell J. Foval, superintendent of recreation at Alton, Ill., in addressing the meeting. Adult participation on the same playgrounds with the young people is reported greater than ever before.

Working at top speed in war plants, sometimes beset with war worries, such wholesome recreation is essential.

As war plants are thrown up, working hours "staggered" and now gasoline rationed, it is increasingly difficult to carry on the usual recreational program at industrial plants. Industries are doing what they can, but permanent facilities at the plants are often practically useless except for lunch hour or pre- and post-shift programs, W. H. Edmund of the Goodyear Aircraft Corporation, pointed out in one of the discussion groups of the War Recreation Congress. New industries, in many cases, are promoting and using community facilities in the neighborhoods where the employees live.

Other recreation leaders present also concentrated on plans to minimize the effect of war on the physical and mental health of John Q. Public.

"War inevitably distorts life," declared Ray Johns, director of field operations for the U. S. O., in addressing the War Recreation Congress. "War pressures and tensions can be met only by persons who have reserves of physical, intellectual, and spiritual resources. Recreation in war-time has an important role to play. Recreation is not a peacetime luxury; it is a war-time necessity. Recreation is more than an escape from war's tensions . . . Recreation maintains, creates morale."

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**GUAYULE**—These plants are two years old and contain about 9% rubber of dry weight.

#### AGRICULTURE

## Rubber Is Being Grown In California Valley

See Front Cover

► A SEA of guayule plants which will do their bit toward relieving the rubber shortage is shown under cultivation on the front cover of this week's *SCIENCE NEWS LETTER*.

It is the plantation of the Intercontinental Rubber Producers in the Salinas Valley, California, which is said to be the only place in the world where guayule is being cultivated. The plant grows wild in United States and elsewhere.

Rubber can be extracted from the plant after one year's growth, but the best yields are obtained after four years.

The rubber does not occur as latex, as in rubber trees, but as solid particles and shreds embedded in the tissues of the plant, amounting to 18% to 20% of the weight of the plant. In harvesting the entire plant is pulled up roots and all. It is chopped up and ground in water and the rubber floats to the surface.

The photograph on the cover and those on these pages are official pictures from the files of the U. S. Department of Agriculture and the Farm Security Administration.

*Science News Letter, October 10, 1942*



## MEDICINE

## New Celiac Treatment

**Banana-less treatment of baby's disease gives fast relief of symptoms. Hypodermic injection of large doses of crude extracts of liver and B complex vitamins used.**

➤ A NEW, speedy and banana-less treatment for celiac disease has been found.

Celiac disease is "a kind of chronic indigestion" affecting infants and children which has been known as long ago as 1888. It has recently been widely publicized because of the war-caused banana shortage. Bananas, staple article in the modern, healthy baby's diet, are also an important part of the special diet used for some years in treatment of celiac disease.

The new, banana-less treatment for this sickness was devised by Dr. C. D. May, Dr. J. F. McCreary and the late Prof. K. D. Blackfan, in studies at Harvard Medical School. Dr. May and Dr. McCreary, now of Toronto, have turned their entire attention to war work and so report the studies leading to the new treatment in the form of "notes" in the *Journal of Pediatrics*, (September) official organ of the American Academy of Pediatrics.

Their treatment for celiac disease consists in daily hypodermic injections of large doses of crude extracts of liver and the B complex vitamins. The liver extract and the vitamin extract are given

on alternate days. Most patients are given a normal diet for their age from the very outset of treatment. Considerable improvement took place within three to six weeks. Patients previously treated by diet alone required from three or four months to six years, with an average of two years, for improvement.

Although their patients were given normal diets, the physicians state that "where special studies are not being undertaken, it would seem desirable to offer a diet composed of the simple foods well tolerated by patients with celiac disease (skimmed milk, bananas, curds and scraped beef). The diet may

then be liberalized according to the improvement of the patient.

"Naturally, the usual supplement of vitamins A, D, and C should be given, preferably in about twice the amounts required to meet the accepted daily requirements."

Celiac disease is primarily due to a defect in absorption of fat and carbohydrate (sugar and starch foods) from the mucous membrane lining the intestines. This, in turn, may result from deficiency of some factor, extrinsic or intrinsic, needed for the chemical processes by which food is converted into a form that can be absorbed by the intestinal walls and into the blood stream.

Patients with this sometimes fatal disease besides showing signs of intestinal disturbance have greatly distended abdomens, like pot-bellies, while the buttocks, groins and under-arm regions, usually so fat on babies and small children, are wasted almost to skin and bones.

*Science News Letter, October 10, 1942*

## ENGINEERING

## Gas Could Go Farther

**Your rations could be stretched as much as 50% by careful driving and care of your car. SAE board gives ten easy rules.**

➤ BY CAREFUL driving and proper care of your car you can get as much as 150 miles for every 100 you have been getting in your present careless way, save your tires and prolong the useful life of your car.

This is what the men who design and build automobiles say in a report to the Office of Emergency Management prepared by the War Engineering Board of the Society of Automotive Engineers, with J. C. Zeder, chief engineer of the Chrysler Corporation, as chairman.

And this is what they tell you you must do.

1. Drive at moderate speeds; at 30 miles per hour gasoline is saved, car and tires last longer; fuel consumption is 50% lower than at 60.

2. Accelerate moderately; saves gasoline and brakes.

3. Use brakes only when necessary, saves gasoline and brakes.

4. Avoid idling engine unnecessarily, "racing" the motor, "pumping" the accelerator, and excessive use of choke; saves considerable gasoline.

5. Use lightest lubricants recommended for engine, transmission, and differential; saves gasoline by making vehicle easier-running.

6. Keep chassis and parts well lubricated; reduces friction, saves gasoline and wear.

7. Keep ignition system, spark plugs, carburetor, and air-cleaner clean and in good condition; prevents waste of fuel.

8. Keep motor properly tuned, brakes in proper adjustment, wheels properly aligned; assures greatest gasoline economy, tire mileage, and car service.

9. Keep cooling system thermostats at proper setting; gasoline economy reaches maximum when motor operates at highest recommended temperature.

10. Keep tires correctly inflated; for maximum gasoline mileage, inflate to five pounds above specified pressures.

Observe these ten easy rules, and stop worrying about your gasoline ration, your tires and your car. You will be doing the best that can be done for all three, and no one can do more.

*Science News Letter, October 10, 1942*



**WORMS**—That is what the guayule rubber is called when it is in this form after being chopped and crushed and put in settling tanks.

## CHEMISTRY

**To Save Infertile Eggs With Carbon Dioxide**

► TO KEEP infertile eggs fresh even at incubator temperatures is the object of U. S. patent 2,296,544, granted to George Franklin Stewart of Ames, Iowa. The rights have been assigned to Iowa State College Research Foundation.

When eggs are incubated, many of them turn out to be infertile. This can be recognized before the chicks are hatched and the infertile eggs removed. But meanwhile they have spoiled and must be thrown away. This spoilage can be so far prevented, the inventor finds, that the rejected eggs will still be suitable for human consumption.

The eggs soon after laying are placed in an air-tight container, the air in which is loaded with 10% to 15% of carbon dioxide—the soda-pop gas. This gas prevents deterioration but does not interfere with embryonic development. After exposure of from 20 to 30 hours to a temperature of 100 degrees Fahrenheit, the fertile can be distinguished from the infertile eggs. The latter are removed and sent to market, while the incubation of the others is continued until the chicks hatch.

*Science News Letter, October 10, 1942*

## CHEMISTRY

**Soybean Rubber Substitute, More Elastic Than Rubber**

► A RUBBER-LIKE material that can be made from soybean protein or from other vegetable proteins is described in United States patent 2,296,464, granted to Robert Brown of New York, N. Y. The inventor claims that his material is more elastic than natural rubber and has great strength.

The beans are ground up and the fats and oils removed leaving only the protein. The protein meal is then mixed with water and quicklime, stirred, and finally a clear yellowish viscous liquid is filtered out. Chlorine gas is bubbled through it, and the liquid is then allowed to stand for about three days during which time coagulation or polymerization occurs.

At this stage, if the liquid is spread over a surface and dried by steam, a clear soft film is formed which, the inventor says, has many of the properties of rubber but is not highly elastic. Nevertheless it can replace natural rubber in a number of uses.

To increase the elasticity, carbon disulfide is added to the liquid, another

but shorter chlorine treatment is given, and another period of standing allowed. When the liquid is now spread over a surface and dried, a thin brown film is formed which, the inventor says, is considerably more elastic than natural rubber. It is also strong, he says, and entirely unaffected by fats, oils and greases, so that it is admirably suited for gaskets and the like.

The United States Department of Agriculture at its Northern Research Laboratory in Peoria, Ill., has been experimenting with substitutes derived from soybean oil and from corn oil, but has claimed a stretch of only about a third that of natural rubber. (See SNL, July 18)

*Science News Letter, October 10, 1942*

## ENGINEERING

**"Calling All Horsepower" Drive for War Begun**

► THE ELECTRIC industry is "calling all horsepower," in the words of A. C. Streamer, Westinghouse vice president, in a letter issued following WPB suggestions.

Just as men can work and are working harder than usual during this war-time emergency, so can electric machinery deliver more than its rated power without damage. These ratings have always been conservative, said Mr. Streamer, not merely to avoid danger but to insure long life and low maintenance cost. The machines can be driven up to 25% above rated capacity without approaching the danger point, and save up to 40% of the copper, aluminum and steel used in their manufacture.

Customarily, to do a 1¼ horsepower job, a 1½ horsepower motor would be employed. If a one horsepower motor is substituted, which is perfectly feasible with an open-air motor, 36 pounds of vital war materials are saved. For higher powers correspondingly greater savings are made. Enclosed motors, however, can only be overloaded to 10% or 15%, Mr. Streamer said. Surrounding temperatures and other conditions must be considered in deciding the permissible overload.

Recommended also was the use of high-speed in place of low-speed motors wherever practical. High-speed motors are smaller and require less critical materials.

Alternating in place of direct current motors and higher voltages were recommended for the same reasons.

Control and protective equipment, he warned, should be carefully matched to the new requirements.

*Science News Letter, October 10, 1942*

## IN SCIENCE

## ENGINEERING

**Ingenious New Method Determines Powder Sizes**

► POWDER metallurgy, now coming into extensive use, requires that the sizes of the metallic grains, particularly the proportions of grains of different sizes that make up the powder, shall be accurately known. An instrument which does all this in 15 minutes as against eight hours previously required has been developed by Westinghouse Electric & Manufacturing Company.

A sample of the powder is shaken up in a long tube filled with acetone and the powder is then allowed to settle. The rate of settling depends on the particle size. Instead of waiting eight hours for the tube to clear, which incidentally gives no information about the powder composition, a beam of light passing through the tube is measured at intervals by an electric eye (photoelectric cell). This gives the opacity of the liquid, hence the rates of settling and the powder sizes.

*Science News Letter, October 10, 1942*

## MEDICINE

**First Aid Textbook Going To South American People**

► CENTRAL and South Americans will soon be practicing splinting, bandaging and artificial respiration on each other; as we did in the United States last winter and spring, it appears from an announcement from American Red Cross Chairman, Norman H. Davis.

The gray American Red Cross first aid textbook, now familiar to millions of North Americans, has been translated into Spanish and Portuguese and will soon be available for distribution to all Central and South American countries, Mr. Davis said.

The translations will be made by the Mexican Red Cross and the Brazilian Red Cross with the permission of the American Red Cross, Mr. Davis said. Previously, distribution of the first aid textbook had been limited to Mexico and Venezuela.

*Science News Letter, October 10, 1942*



# NE FIELDS

## PHYSICS

### Static Electricity May Cause Fire or Explosion

► SPARKS CAUSED by static electricity are a fire and explosion hazard in many industries. The National Bureau of Standards has put out an easily read circular (C438), which describes the various causes and cures of this hazard. It can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 10 cents.

*Science News Letter, October 10, 1942*

## GENERAL SCIENCE

### New World After the War Will Require Cooperation

► "IT WILL be a new world into which we will enter once this war is over, and in this new world we will have industrial problems which only industry can solve cooperatively."

These words were spoken in Colorado Springs before the American Institute of Steel Construction by Clyde G. Conley, president of the Institute.

The many new materials and substitutes developed during this period will not be quietly withdrawn at the end of the war, he said further, leaving the markets to the older industries which formerly dominated them. Safer and stronger steels, the economies and short cuts, which ingenuity and engineering skills have effected under the spur of war's exacting demands, should redound to the permanent advantage of the consumers of steel during the years ahead.

The structural steel fabricators have built the new factories in which are built more planes, tanks, guns, munitions and every kind of modern weapon. That program they have carried to a successful conclusion, he stated. Now they are asked to make "strange parts" to an accuracy many of them have never before attempted. This requires new tooling up, training of new operators and retraining of old ones. But these requirements are being met.

At the same time, strictest economy in the use of steel is demanded. Where-

ever possible substitutes must be employed, wood, cement, etc. And the steel must carry heavier loads. Fortunately, metallurgical improvements, Mr. Conley pointed out, insure more uniform steel, safer, stronger, which can safely bear the heavier loads.

All of the achievements of the structural steel industry during the past months cannot now be recounted, he said, but he assured his listeners that the record had been a glorious one.

*Science News Letter, October 10, 1942*

## METEOROLOGY

### Dust Storms in Egypt Have Increased Tenfold Since War

► DUST STORMS in the Egyptian desert are now occurring at the rate of one a week, adding a new complication to desert fighting. Before the war, desert dwellers had only sand storms to contend with, writes Dr. H. Heywood, of the Imperial College of Science and Technology (*Nature*, Sept. 5).

But due to war conditions, such as the construction of fortifications and movement of trucks and tanks, as well as the destruction of desert scrub by fleeing Bedouins, dust storms have increased from an average of five a year, before 1940, to a total of 54 last year.

The biggest single reason for such a change, according to meteorologists, is the destruction of desert scrub. While this was low and somewhat scarce, the roots extending several feet around each plant tended to hold the surface soil in place.

"I had regarded the term 'dust storm'" (reported every few days as interfering with Middle East fighting) "as being somewhat loosely applied . . . to include sand storms," writes Dr. Heywood, "but I have recently had the opportunity of reading a paper by Prof. F. W. Oliver which throws new light on this point."

For the past seven years, Prof. Oliver has lived at Burg-el-Arab, thirty miles west of Alexandria, close to Egyptian desert fighting. He states that extensive measures will have to be taken after the war, to combat the increasingly severe storms, and make these regions livable again.

As inhabitants of our own Great Plains area have discovered, there is no escape from a dust storm. It seeps through closed windows, filling your nose and throat with fine dust. And of course soldiers in the desert are apt to be completely unprotected from the driving dust winds.

*Science News Letter, October 10, 1942*

## ORNITHOLOGY

### Oldest Known Bank Swallow Seven Years Old Reported

► THE WORLD'S oldest known bank swallow, as aged at 7 years as a 115-year-old human, has been reported by Dr. Dayton Stoner, zoologist of New York State Museum, and his wife, Lillian C. Stoner.

With the average life-span of the bank swallow two to three years, this venerable bird breaks the previous record for longevity held by a six-year-old bank swallow, recovered by the Stoners in 1937.

The present record-holder proudly wears the date "May 27, 1936," with which he was banded as a yearling. That was six years ago, bringing his present age up to 7.

"In this species," say the Stoners, "there are no external differences between the sexes," but the evidence (discrepancy in weight between him and his mate) "strongly suggests that this individual is a male."

*Science News Letter, October 10, 1942*

## ENGINEERING

### Washing Machine Imitates Hand Laundering Method

► A WASHING MACHINE that handles delicate fabrics in much the same way that the lady of the house would if she were washing her things herself is the invention of Frank Breckenridge of Mansfield, Ohio, for which he has received U. S. patent 2,296,257. He has assigned the rights to Westinghouse Electric & Manufacturing Company of East Pittsburgh, Pa. But for the duration we shall probably have to get along with the old machine.

The special feature of the new machine is a circular basket turning on an inclined axle, so arranged that only a portion of it dips into the water of the tub at any one time. The flaring sides of the basket are perforated but the bottom is solid and corrugated. Vanes along the sides lift the fabrics from the water, as the basket slowly revolves, and drop them in again, but causing them to rub against the corrugated sloping bottom on the way, thus simulating the actual operations of hand washing.

Another feature of the machine is that after the water has been drained off the same basket can be rotated at high speed and the clothes partially dried by centrifugal force.

*Science News Letter, October 10, 1942*

## PSYCHOLOGY

# Picking Flyers

Army scientists in the Air Surgeon's Office devise psychological tests to choose cadets likely to succeed as navigators, bombardiers and pilots.

By MARJORIE VAN DE WATER

► THE BIG MOMENT has arrived for a U. S. aviation cadet. He is not about to take off on his first solo. He is not about to have his silver wings pinned on his breast.

He is standing high above the ground, balanced precariously on one foot on a moving plank while, high above his head, he tries to hold the point of a pin-sized stylus steadily in a nail-sized hole without once allowing it to touch the hole's edges. If he thinks now of the danger of a fall from this uncertain perch—if his hand trembles ever so slightly, he will fail.

Yet this test may decide whether he will ever wear a pilot's wings in the U. S. Army.

The job is hard. It taxes all his nerve and self-control. If you don't think so, just try sticking a needle into the ceiling and then balancing on the top of a teet-



*TEETERING on a loose board, this cadet is being tested for hand steadiness and fear of heights. Official photograph of U. S. Army Air Forces.*

ering ladder while you try to thread it. But just don't break your neck doing it.

This beam balancing test is one of the new psychological tests being developed by Army scientists in the Air Surgeon's Office. All aviation cadets must take these classification tests before they go into training to master the controls of a plane, or to operate the new secret bombsight or to plan and direct long flights from Shangri La to Tokio or Berlin.

Each man is allowed to choose the type of training he would like, as soon as he has passed the initial qualifying examination and receives his appointment in the Army Air Forces. But before he can enter that training he must prove his ability for it.

He must show how quick and accurate he is with his hands and arms by reaching for small pegs and fitting them rapidly and without fumbling into small holes. He has to prove that he can pick up pegs with one hand and turn them dextrously and replace them without clumsiness.

## Speed of Decision

He must show how quickly he can make a decision and act on it by moving control levers in the correct way in response to different combinations of signals flashed to him from an "instrument board."

Another steadiness test—this one looks easy. He is seated comfortably and the metal plate with the nailsized hole is within easy reach before him. All he has to do is to hold that pin-sized metal point in the hole without allowing his hand to shake.

But all of a sudden bedlam breaks loose. Bang! Whee-e-e-e! Horns and gongs may blare out with ear-splitting shrillness. Does his hand shake?

Now a voice bellows from behind him, "IF YOU ARE RATTLED NOW, what will you do when you are in COMBAT!"

It is all a part of the test—this heckling from the sergeant kibitzing behind his chair. But the aviation cadet doesn't know this. So if he is the type who can't stand this sort of distraction, he

may become flustered. He may lose his temper and forget all about the test. Or he may become so harried that he can't hold his hand steady, try as he will.

But not all the tests are so trying on the patience and self-control. Another looks like something at the amusement park or penny arcade. It reminds the men of the pinball machine that used to provide fun in many a corner store. But it is operated by manipulating two levers—one in each hand. If you work your hands in perfect unison and do it just right, you can make a metal pin travel in a straight course around a triangular groove. The edges of the groove are notched to snare the pin at the slightest faulty movement.

## Simulated Controls

A favorite test of the boy who has wanted all his life to be an airplane pilot is the test that makes him feel that he has already stepped into the cockpit of a trainer. Here is a joystick and a rudder bar. He gets his hand and feet on them at last. It is up to him to show that he can work these controls. Before him is a signal board of flashing lights. He must so operate the controls that the red and green lights are brought into straight lines.

What this test really measures is the ability of the cadet to move his hands and feet in perfect coordination. Actually coordination is necessary for the bombardier as well as for the pilot.

He spends many hours on such tests and others that show how good he is at mathematics, reasoning, map reading, comprehension of written material, dial reading, table reading, and speed of identification.

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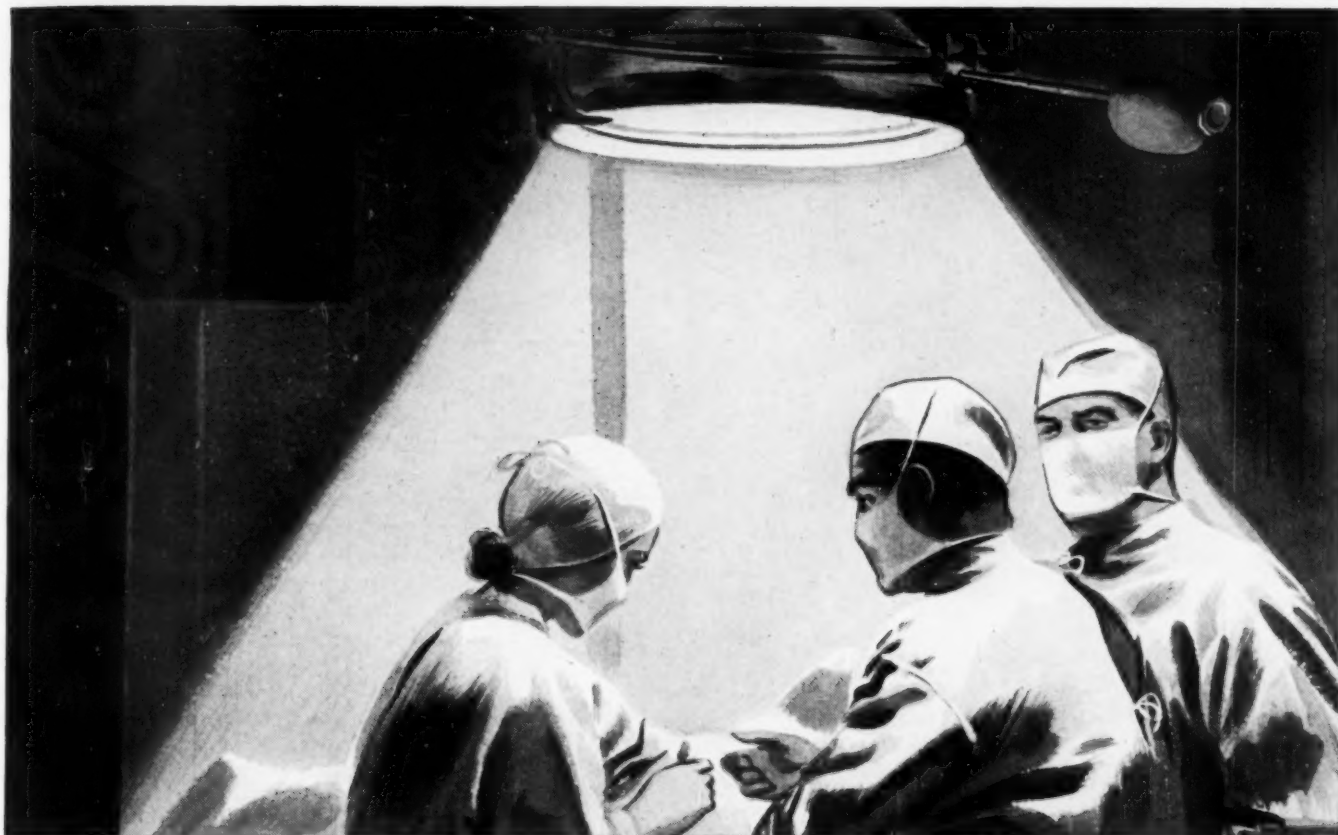
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## Abandon hope . . . all Germs who enter here

**S**CIENTISTS HAVE LONG KNOWN that certain wave lengths in the ultraviolet spectrum are true "death rays" to the world of bacteria.

The rays in the narrow region of 2500-2600 Angstrom units . . . about 1/100,000 of an inch in length . . . were found to have the greatest bacteria-killing power.

The problem was to devise a practical and efficient device for transmitting selected ultraviolet radiations within a given bactericidal range.

The device must not generate a lot of heat. It should have long life. It should be inexpensive and easy to install and operate. Most of its radiation must be in the region of peak bactericidal effectiveness. It must produce only a limited amount of ozone.

Some years ago one of the scientists of the Westinghouse (Lamp Division) Re-

search Laboratory, which is under the direction of Dr. Harvey C. Rentschler, produced an ultraviolet generator meeting these difficult requirements.

Further research and patient effort brought about a commercial ultraviolet bactericidal lamp that emitted about 84% of its ultraviolet at 2537 Angstrom units . . . a lamp that was efficient and relatively cool during operation . . . that produced an amount of ozone sufficient to correct odors and protect areas not directly irradiated, but insufficient to cause taste change or detrimentally affect food products. This lamp was marketed under the trade mark, *Sterilamp*.\*

In hospitals, the Sterilamp\* stops air-borne infections from entering wounds and incisions . . . by providing a protective zone of sterile, bacteria-free air around

\*Trade Mark Reg. U. S. Pat. Off.

the patient on the operating table.

When properly installed in air-conditioning systems in hospitals, schools, and nurseries, the Sterilamp\* is the most effective agent known for reducing cross-infection . . . the spread of air-borne contagious diseases.

The commercial applications of the Sterilamp\* are practically endless. It is used in the "Tenderay" process for tenderizing meat . . . and in bakeries, breweries, wineries, canneries, restaurants, biological laboratories, lavatories . . . wherever air-borne bacteria must be killed or controlled.

In the Sterilamp\*, Westinghouse "know how" has scored a notable victory over the invisible enemies of mankind. Today, Westinghouse scientists are hard at work developing weapons that will score the same kind of victory in our war against the Axis.



# Westinghouse





**SPEED OF DECISION** is tested when the cadet must operate the correct control in response to flashing light combinations as shown in this official photograph from the U. S. Army Air Forces.

If a man does well on all the tests, he is then assigned to the type of training that he prefers. But if he is particularly good at some of the tests and does less well on others, he is assigned to the type of work for which he is best fitted.

Careful selection of the right man for the right job makes it possible to speed up training and get the men into the air over the war area in the shortest possible time.

If a man were trained to be a navigator just because he wanted to do that sort of work, although his talents really fit him for piloting or bombing the chances are he would never complete the course creditably. He would have to drop out eventually and be replaced by a better qualified man. The U. S. Army Air Forces would be delayed in getting a good navigator. At the same time he would be using the precious time of instructor and equipment for which some other man is waiting.

The Army does not want failures in training. They want to put each man where he will make good and will make good fast.

The famous team of pilot-navigator-bombardier who are writing history in the skies over Germany, the Aleutians, or the South Sea Islands are not all alike in their personalities or talents. They supplement each other. They dovetail.

Precision bombing requires speed and accuracy. When you drop a bomb from a very high altitude, even a tiny error will make the bomb fall far wide of its mark. That means precious ammunition wasted. It means prolonging the war.

But when you are bombing from very low altitudes, the target zips past your field of view at such a tremendous

speed that great speed and accuracy of timing are essential.

The bombardier must use the secret bomb sight. This is an instrument which can be set and automatically performs all the computations and adjustments necessary to put the bomb on the target. The bombardier must be able to operate over a score of switches, and watch numerous instruments estimating drift, wind, altitude, and speed.

If he fails in doing all this with precision, in spite of all the breath-taking distractions and hazards of combat above the earth's firm ground, the entire bombing mission will be for nothing.

The pilot must control a plane traveling at speeds that he has never before encountered. He must know what to do if a part of his plane is disabled. He must be able to fight off enemy attacks or to evade them. He must be able to take upon himself a tremendous amount of responsibility when he takes off in a large bomber worth thousands of dollars and heavily loaded with high explosives. A misjudgment might cost many lives.

The navigator must be able to find the target and guide the plane safely home. How many planes fail to find their targets is a military secret, but it is recognized that the job of the navigator is an extremely important one.

### Must Do Without Radio

He must know many types of navigation and know what to do when one fails. He must be able to use the radio beacon, the radio direction finder, and radio bearings. But when there is radio silence he must find his way without radio aids.

He must know how to determine his position and his course by the stars. But on a cloudy night or in "pea soup" he must know which way to turn.

He must know dead reckoning, which is the method of finding your position from a record of the distances traveled after each change in direction beginning with the last known position. And he must know how to find his way by observing landmarks and following a map.

All these flying officers must have certain qualities which are measured by the qualifying examination taken when the would-be aviation cadet first applies at one of the several hundred Aviation Cadet Examining Boards that are dotted over the United States. They must be able to read understandingly all the difficult material (*Turn to page 238*)

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### Leaving Home

► THE FLIGHT of birds toward the south, as winter approaches, was one of the first objects of naturalists' curiosity. In the ancient world, when people traveled much less than the birds, all sorts of speculations arose over their annual disappearance. Big, conspicuous birds like storks were seen by occasional travelers in Egypt, and the inference was correctly made that they were the same storks that had been nesting in the countries north of the Mediterranean during the summer.

Smaller birds, however, had a way of mysteriously vanishing over night, and some astonishing notions arose about what became of them. Even Aristotle turned a credulous ear to the report that swallows dived to the bottoms of ponds and spent the winter wrapped in balls of mud. It's a curious thing, but there is no known case of a bird hibernating in any way. Bats do, but birds don't.

Sure as birds start toward the south in autumn, some human songster will start tuning up on that old sentimental favorite about "When the swallows homeward fly." It's nice music, but poor ornithology. Swallows, and all other southward-migrating birds, are not going home in the fall; they are leaving home. Home is where the nest is. They leave home to avoid the hardships of winter, and come back home in the spring to raise new families.

At least a beginning was made, about a quarter-century ago, toward a solution of the mystery of what starts birds southward. It isn't chilly weather, for many migrations begin while it is still quite warm. It turns out to be the shortening days. This was experimentally

demonstrated by several researchers, who kept wild birds in cages for a few weeks, artificially controlling the length of daylight hours. It proved possible to confuse the poor birds utterly, starting them northward instead of southward, simply by adding electric illumination to the daylight period and giving them longer days, like those of spring, instead of the shortening days of autumn.

Another curious thing about birds wintering in the south is that species from our Atlantic and Pacific coasts

often occupy the same areas in Central America. Yet when spring comes they somehow sort themselves out all right, and each kind gets back to its proper nesting grounds without apparent confusion or difficulty.

*Science News Letter, October 10, 1942*

Deterioration of most insecticides is negligible, if they are stored properly; protection from freezing of liquid sprays, and from dampness in the case of powders are the primary precautions.



## American War Birds Have Keen Eyes

FOR America's fighting forces, strictest requirements are imposed on the men who fly the fighter planes. Stamina, keen perception and split-second timing depend on condition. In the most critical physical examinations, particular emphasis is given to perfection of vision.

Several years ago, at the request of U. S. Army officials, Bausch & Lomb developed a special anti-glare glass for use in bright overcloud flying. This glass, known as Ray-Ban, has the remarkable property of filtering out excess glare-producing light, at the same time transmitting most of the light useful for seeing. Army, Navy and airline pilots—as well as target shooters and motorists—have welcomed the cool, comfortable, keen vision that Ray-Ban affords.

So, again, and in still another way, Bausch & Lomb gives aid to America's all-out for Victory. Its other contributions, more obvious, include gunfire control equipment—range finders, binoculars, aerial height finders. Behind the scenes, but of no less importance, are the instruments of industrial research and production—metallographic equipment, spectrographs, toolmakers' microscopes, contour-measuring projectors. Bausch & Lomb eyewear products—eye examination instruments, spectacle lenses and frames—keep a nation of workers at top visual efficiency.

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## From Page 236

that they must master in their profession. They must be good at elementary mathematics and at understanding mechanical devices and diagrams. They must be able to read maps and weather reports. They must be good leaders.

Finally, they must have good judgment. The navigator who had poor judgment would never be able to find the objective. The bombardier who had poor judgment would not be able to place the deadly missiles accurately on the target. The pilot who had poor judgment might take all hands crashing to their death.

The qualifying examination which picks men who can meet these demands and screens out those who would waste training time and eventually wash out is not exactly an easy test. Only about half the men who have taken it so far have passed and been appointed.

But this qualifying examination is one of the most important of the Army's war weapons. For it is because of this test and the classification tests taken later that the Army is able to make the most effective use of our most precious of all resources—manpower.

*Science News Letter, October 10, 1942*



**FORETASTE OF FLIGHT** is given aviation cadets by new psychological tests being developed by Army scientists. This picture shows a cadet working joy stick and rudder bar in response to flashing light signals to determine his coordination of the movements of his hands and feet. Official photograph of U. S. Army Air Forces.

PHYSICS

## Power From Sunbeams

The post-war world may get its energy by snatching it from the sun's rays. Main obstacle is that power produced depends on area over which light is gathered.

➤ MAN IS harnessing the sun to supply power for his home, factories, and vehicles. Long a dream, present research indicates that the future world may be powered by energy snatched from a sunbeam. But practical application awaits results of the long range research program now being conducted.

Many such glimpses of happenings in science are presented in the annual report of the Smithsonian Institution.

Utilization of scientific advances in post-war reconstruction, however, will require sources of power not dependent on dwindling resources.

Energy equal to 21,000,000,000 tons of coal which the sun showers on the surface of our globe every hour, offers fascinating possibilities.

There is one major obstacle to harnessing this power: economics. Power produced, the report indicates, depends

directly on the area over which solar energy is gathered. This would need to be large and the cost consequently high. Solution of this problem has been a foremost objective at Smithsonian.

Dr. Charles G. Abbot, secretary of the Institution, has built highly efficient solar engines which have come close to eco-

## Books

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## ● RADIO

Saturday, October 17, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Selman A. Waksman, microbiologist of the New Jersey State Agricultural Experiment Station, will tell of some of the disease-producing germs in soil and of soil microbes that destroy them.

Tuesday, October 13, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods, over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

conomic practicability compared with other power-producing systems.

Various possibilities of solar energy are outlined in the Smithsonian report by Dr. H. C. Hottel of the Massachusetts Institute of Technology, where experiments are also being conducted. Their program calls for exploration of all the possibilities of economic conversion of solar energy into forms useful in industry.

One method would be direct conversion of the sun's rays into electricity. This would be based on the principle of the thermocouple. That is, when two wires of two different elements are joined and the junction is heated, a small part of the heat is converted into electrical energy. Efficiency here depends on the properties of the two materials used. Intensive study is now in progress, Dr. Hottel reports, to learn which metallic compounds give best results.

Another apparatus is operated by photoelectricity—the same principle which operates the exposure meter used by photographers. Here the light strikes a prepared metal plate which also results in conversion to electrical energy.

Or perhaps we can duplicate nature's own method of storing solar energy, it is suggested. Through chlorophyll, the green stuff in leaves, sunlight is stored in growing things. Perhaps millions of years later it is released by the burning of coal or oil. It is hoped that through a thorough understanding of nature's process, we may be able to make synthetic fuels out of easily available chemicals.

Atomic power, discussed by Dr. Ernest O. Lawrence of the University of California, is also much in the news. Recent progress must be kept secret at this time. But up to about a year ago the status was about that of aviation 50 years ago. That is, the basic principles are known, but practical application awaits the development of a new instrument or technique.

Science News Letter, October 10, 1942

## PUBLIC HEALTH

# Wear a Sweater

With fuel rationed and office and home temperatures low, it will be aiding to win the war if you dress yourself in warm clothing, physicians advise.

► "WEAR A SWEATER and help win the war" is the slogan suggested in a report to the OPA by a committee on health aspects of fuel rationing. The report, tentatively accepted by the OPA, is summarized in the *Journal of the American Medical Association* (Oct. 3).

There is a "dearth of scientific information as to tolerable minimum temperatures," the editor of the *Journal* points out. So the medical advisory committee to the OPA, headed by Dr. Leverett D. Bristol, of New York, had to disregard standard published recommendations for heating and ventilating comfort and attempt to establish a safe zone at a lower temperature which would protect health and not be too uncomfortable.

Temperatures of 60 to 68 degrees Fahrenheit, majority opinion 65° F., were considered the minimum for the average private home, apartment house, stores, office buildings and schools, with a range of 60° to 70° F. for the latter. For hospitals and sanatoriums, temperatures of 68° to 80° F. were recommended, the majority opinion holding for 70° F. except operating rooms, which should be 80° F.

Homes with one or more children under four years, one or more persons over 65 years, one or more cases of illness, and convalescents or those with low vitality should have a temperature of not less than 70° F.

Our winter indoor temperatures in the past have been too high and our atmospheres too dry. The English, the committee points out, believe as a result of experience with radiant heat that a 60° F. dry bulb temperature is adequate if room occupants are properly clothed. This is the cue for the wear-a-sweater slogan the committee suggested to emphasize the point that each of us must be his own clothing engineer and take care of winter health and comfort in over-cooled rooms by dressing for the new indoor weather.

"The body adjusts itself readily," the summarized report states, "to temperatures at least 10 degrees below what we in the United States consider the standard temperature for dwelling houses."

"Reduced indoor temperature is less apt to injure persons in good physical condition and having good health habits," the summary continues. "The usual recommendations relative to exercise, sunlight, food and rest are stressed. Adequate clothing, and especially foot covering, is emphasized. Cold baths of short duration are recommended for certain persons. Overfatigue should be avoided.

"While most of our winter ills are due to bacterial and virus infections, scientific evidence shows the important relationship of lowered resistances and changes of weather to these conditions. There is little experimental evidence to show what an individual in a wartime economy can get along without in his artificial heat requirements without injury to health."

Science News Letter, October 10, 1942

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# • New Machines and Gadgets •

☼ **THE MEDICINE** dropper with its rubber bulb has been eliminated by at least one drug dispenser in the following way. The top of the bottle is covered with a new type of cellulose film in which are two small holes. The medicine is dispensed by allowing it to drop from one or other of the two holes. The bottle is the same as that formerly used and sold with a medicine dropper included.

Science News Letter, October 10, 1942

☼ **TOOTHPASTE TUBES** of lead have won the approval of the American Dental Association, and two companies are making them. More than 50 types of waxes and resinous coatings have been designed to protect various kinds of contents from the lead, and it is said that not more than 20 parts of lead per million by weight would be absorbed by any material.

Science News Letter, October 10, 1942

☼ **X-RAY PICTURES** in industry may be speeded up by a faster fine-grain photographic film now available. The new film is said to be twice as fast as those now in general use. Shorter exposures or lower voltages will also reduce wear on equipment.

Science News Letter, October 10, 1942

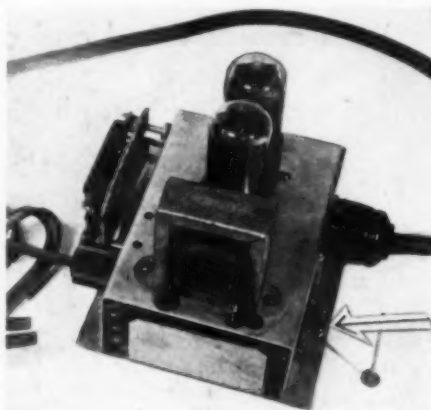
☼ **RAYON SHOE** laces can be treated with a combination of waxes to make them more flexible. And when you tie a knot it remains tied.

Science News Letter, October 10, 1942

☼ **TO KEEP SALT** dry is the object of a salt shaker recently patented which the inventor claims is moisture-proof. The shaker has a single opening at the top through which the salt may issue. The flow of salt is retarded by a sort of valve shaped like an hour glass except that the narrow portion is longer. This narrow portion fits loosely in the hole at the top. When the shaker is inverted, the valve drops down, opening the hole. When the shaker is turned upright again, the valve drops back closing the hole and preventing entrance of moisture.

Science News Letter, October 10, 1942

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 135.



☼ **LITTLE THINGS** control big things in the device illustrated. It is an electronic control instrument in which the smallest things in the world, the electrons, may control the movements of massive machinery, and do it with a nicety and fineness never attained by any other means. In the compact little instrument shown, the movement of a cat's whisker will reverse the rotation of an electric motor. It will respond to variations of a light beam and to many other delicate forces or movements.

Science News Letter, October 10, 1942

## • Books Just Off the Press •

**AFTER EFFECTS OF BRAIN INJURIES IN WAR**—Kurt Goldstein—Grune & Stratton, Inc., 250 p., illus., \$4.

**THE AMERICAN STUDENT FLYER**—Merrill C. Hamburg and George H. Tweney—Pitman, 692 p., illus., \$1.50. A high school textbook not about flying but actually teaching it.

**ARC WELDING**—American Technical Society, 103 p., illus., \$1.25.

**A BIBLIOGRAPHY OF BOOKS FOR YOUNG CHILDREN**—Association for Childhood Education, 79 p., 50 c.

**THE CRANE FLIES (TIPULIDAE) OF THE GEORGE RESERVE, MICHIGAN**—J. Speed Rogers—Univ. of Mich., 128 p., illus., \$1.25.

**EXPERIMENTS IN ORGANIC CHEMISTRY**—E. Wertheim—Blakiston, 221 p., diagr., \$1.35.

**FRUITS OF THE EARTH**—Jannette May Lucas—Lippincott, 71 p., illus., \$2. Excellent book for armchair and dirt farmers. Tells origin, travels, adaptation and development of many everyday fruits. Illustrations delightful.

**THE FUTURE OF TELEVISION**—Orrin E. Dunlap, Jr.—Harpers, 194 p., \$2.50.

**GAS WELDING**—American Technical Society, 1942, 92 p., illus., \$1.25.

**HALF A CENTURY OF PROGRESS**—Ira L. Smith—Association for Childhood Education, 48 p., 50c. A review of the past fifty years of the International Kindergarten Union, now the Association for Childhood Education.

**HEALTH FACTS FOR COLLEGE STUDENTS** (4th ed.)—Maude Lee Etheredge—Saunders, 379 p., diagr., \$2.25.

**AN INTRODUCTION TO SOCIOLOGY**—John Lewis Gillin and John Philip Gillin—Macmillan, 806 p., illus., \$3.75 (corrected price).

**JANE'S ALL THE WORLD'S AIRCRAFT 1941**—Leonard Bridgman, ed.—Macmillan, 449 p., illus., \$19. Complete record of aeronautical progress throughout the world during the year.

**JANE'S FIGHTING SHIPS, 1941**—Francis E. McMurtrie, ed.—Macmillan, 529 p., illus., \$19. Complete and authentic information on all the navies of the world with over 3,000 photographs and illustrations.

**MINORITY PEOPLES IN A NATION AT WAR**—Thorsten Sellin (ed.)—Amer. Academy of Pol. & Social Sciences, 276 p., paper \$2, cloth \$2.50. Raises delicate problems of prime importance in winning the war and preparing peace.

**A MILLION YEARS OF HUMAN PROGRESS**—Ira D. Cardiff—Dorset, 147 p., \$2.

**NATURAL HISTORY WITH A CAMERA**—L. W. Brownell—Amer. Photographic Publishing Co., 292 p., illus., \$3.75. Reminding us that war is only a part of the modern scene; this book by the outstanding nature photographer will appeal to camera artists and naturalists alike.

**PRINCIPLES OF STELLAR DYNAMICS**—S. Chandrasekhar—Univ. of Chicago Press, 251 p., illus., \$5.

**RECORDS AND REPORTS**—Association for Childhood Education, 32 p., 35c.

**SEEDTIME AND HARVEST TODAY**—Reginald G. Hainsworth, Oliver E. Baker and Albert P. Brodell—U. S. Gov't Print. Office, 97 p., illus., 25c. Valuable book for farmers. Contains maps, charts and illustrations.

**SO YOUR HUSBAND'S GONE TO WAR**—Ethel Gorham—Doubleday, 223 p., \$2. Written by the head fashion writer of a smart Fifth Avenue store, who is also a wartime wife and mother.

**STAR MAPS FOR BEGINNERS**—I. M. Levitt and Roy K. Marshall—Published by authors, 32 p., illus., 50c.

**VICTORY OVER FEAR**—John Dollard—Reynal, 213 p., \$2.

**WHO'S WHO IN AVIATION**—Writers' Program-WPA—Ziff-Davis Co., 486 p., \$5. Welcome addition to the growing family of Who's Whos. Marked by some conspicuous gaps which may be corrected in later editions.

**WARTIME GUIDE BOOK**—Popular Science Pub. Co., 260 p., illus., diagr., \$1.98.